

Title: A Product Development Team for Snow and Ice Climate Data Records

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Recent studies have shown that Northern Hemisphere sea ice extent and thickness have decreased dramatically in response to surface warming over the last 30 years. In the Antarctic, some ice shelves have recently collapsed due to rising temperatures, though responses to climate change in the continental interior are not as straightforward. While these studies generally agree that the Arctic and parts of the Antarctic have been warming, it is not clear how other aspects of the climate system have responded. For example, how do changes in surface and cloud properties interact and affect the surface energy budget? How do changes in the cryosphere affect global climate? How will the changes affect coastal communities and access to resources in the Arctic?

The availability, consistency and accuracy of cryospheric products are thus critical for a wide range of applications ranging from climate change detection, climate modeling, and operational uses such as shipping and hazard mitigation. In turn, full exploitation of cryospheric products can benefit greatly from the support provided by a coordinated group of data and applications experts. We propose to create a Cryosphere Product Development Team that will provide such coordination for the generation, validation, and archival of fundamental and thematic snow and ice climate data records (FCDR and TCDR) that the scientific community can use to help answer these and other questions about a changing global climate. We will coordinate existing and new products, establish “best practices”, and will update heritage products to allow NOAA to continue with their production and dissemination. Our focus is on products that can be derived from optical (visible, near-IR, and thermal IR) and passive microwave imagers. FCDRs will be created where necessary and used in the production of TCDRs.

We will build on our extensive experience in producing geophysical fields from satellite sensor data records (SDR). Our goal is to refine, extend, validate, document, and archive visible, infrared, and passive microwave cryosphere products. Snow and ice products exist for both heritage (AVHRR, SSM/I) and newer (MODIS, AMSR-E) instruments, and are planned for the future VIIRS and MIS sensors. We propose to merge the existing data into consistent time series, and use these series as a basis for transitioning to NPP and NPOESS products. We will build on existing efforts, coordinating with other funded products, as appropriate. We have assembled a polar products development team that is uniquely qualified for this effort.

This is a multi-institutional proposal from the NOAA National Environmental Satellite, Data, and Information Service (NESDIS), including its Cooperative Institute for Meteorological Satellite Studies (CIMSS)/University of Wisconsin, NASA Goddard Space Flight Center (GSFC), the University of Colorado (CU), and the National Snow and Ice Data Center housed within the CU/NOAA Cooperative Institute for Research in Environmental Sciences (CIRES).